

1. (Twice Amended) A communication system which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or base station comprising:

- a medium access control sub-layer;
- upper layers of said medium access control sub-layer; and
- a lower layer of said medium access control sub-layer,

wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or lower layer in response to requests therefrom, and wherein said medium access control sub-layer includes a common control channel group and a dedicated control channel group which have logical-type channels.

2. (Twice Amended) The communication system as set forth in claim 1, wherein said basic functions include at least one of:

- a random access control information transfer function,
- a control information transfer function,
- a user information transfer function,
- framing/deframing functions,
- segmentation/reassembly functions,

functions of dividing a frame of a specific one of said upper layers into channels of said lower layer and vice versa,

a cyclic redundancy check function,

a function of detecting an error of a medium access control sub-layer frame, and

a rate adaptation function of adjusting a number of bits suitably for a radio frame.

3. (Twice Amended) The communication system as set forth in claim 1, wherein said associated functions include at least one of:

a synchronization information control function;

a system information control function,

lower channel activation/deactivation functions,

quality monitoring and reporting functions of, for maintenance of traffic channel quality, supporting power control, triggering a handover or reporting a channel condition upon traffic channel allocation, and

a multi-bearer sequencing function of sequencing a multi-code.

8. (Twice Amended) The communication system as set forth in claim 1, wherein said medium access control sub-layer includes:

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first channel control means for transferring information for synchronization between an originating end and a terminating end, setting a stand alone dedicated control channel between said originating end and said terminating end and performing a cell setting operation between said originating end and said terminating end using the set control channel; and

second channel control means for providing a connection-oriented point-to-point service to an upper layer of said first channel control means and monitoring a quality of a radio link formed between said originating end and said terminating end.

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15. (Twice Amended) The signal processing method as set forth in claim 14, further

comprising:

performing a random access control operation between said corresponding mobile terminal and said base station, said step of performing said random access control operation including:

sending a radio resource request message from said corresponding mobile terminal to said base station if said random access control operation between said corresponding mobile terminal and said base station is requested;

sending a radio resource request acknowledge message from said base station to said corresponding mobile terminal;

sending a radio resource response message from said base station to said corresponding mobile terminal; and

transferring a radio resource response reception message to a specific one of said upper layers of said corresponding mobile terminal.

16. (Twice Amended) The signal processing method as set forth in claim 14, further comprising:

performing a lower channel activation or deactivation control operation of said corresponding mobile terminal or base station, said step of performing said lower channel activation or deactivation control operation including:

transferring a communication path activation or deactivation request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said lower channel activation or deactivation control operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to activate or deactivate a communication path in response to said communication path activation or deactivation request message from said specific upper layer; and

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allowing said lower layer to transfer the activated or deactivated result to said specific upper layer.

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18. (Twice Amended) The signal processing method as set forth in claim 14, further comprising:

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performing a control information/user information request operation of said corresponding mobile terminal or base station, said step of performing said control information/user information request operating including:

sending a control information/user information request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said base station or corresponding mobile terminal if control information and user information are requested by said specific upper layer of said corresponding mobile terminal or base station.

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23. (Twice Amended) The signal processing method as set forth in claim 14, wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent, and

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wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station.

24. (Amended) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel request acknowledge message has a data frame including an address field region, a reserved region, a medium access control frame type region and a cyclic redundancy check region for detection of a frame error.

25. (Amended) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel response message has a data frame including an address field region, a reserved region, a medium access control frame type region, a cyclic redundancy check region for detection of a frame error, an information region, a padding region and an end of field region.

26. (Amended) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said

base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

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a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel request message has a data frame including an address field region, a reserved region, a medium access control frame type region, a cyclic redundancy check region for detection of a frame error, a paging slot number region and a paging channel number region.

27. (Amended) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said

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medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein each of said channel request acknowledge message, channel response message and channel request message has a data frame including an address field region, a reserved region and a medium access control frame type region.

28. (Amended) A method of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, said initialization mode including:

scanning a synchronization channel in a corresponding one of said mobile terminals upon powering said corresponding mobile terminal;

determining whether valid synchronization information is received in said corresponding mobile terminal; and

proceeding to said idle mode if no valid synchronization information is received in said corresponding mobile terminal and transferring system time information and base station identification information included in said valid synchronization information to a lower layer of said corresponding mobile terminal if said valid synchronization information is received in said corresponding mobile terminal.

30. (Amended) A method of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a

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communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, wherein said idle mode comprises:

receiving system information periodically broadcasted by said base station;

comparing an identification number of the received system information with a system information identification number stored in a corresponding one of said mobile terminals; and

updating the current system information of said corresponding mobile terminal if the received system information is newly modified system information as a result of the compared result.

32. (Amended) A method of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

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performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, wherein said radio resource allocation mode comprises:

sending a channel request message from a corresponding one of said mobile terminals to said base station upon receiving a random access request message from a specific one of said upper layers of said corresponding mobile terminal;

recognizing that a radio resource allocation operation has been completed, upon receiving a channel response message from said base station, and then proceeding to an activate wait state;

transferring a radio resource allocation request message to a lower layer of said corresponding mobile terminal; and

informing said specific upper layer that a radio resource has been set, upon receiving a radio resource activation response message from said lower layer.

33. (Amended) A method of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

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performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, wherein said radio resource allocation mode comprises:

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allocating a radio resource requested by a specific one of said mobile terminals, upon receiving a channel request message from said specific mobile terminal, and then sending a channel response message including allocated frequency information and channel allocation description information from said base station to said specific mobile terminal; and

transferring information regarding the allocated radio resource to a lower layer of said base station to activate said lower layer.
